

WHAT IS CLAIMED IS:

1. A connector comprising
an air conductive first wire;
a first terminal connected to said first wire;
an air conductive second wire;
a second terminal connected to said second wire; and
at least a sealing for hermetically sealing a spacing between said first and second wires for defining a closed space as an air conduction path;

said first terminal and the second terminal being electrically connected to each other to interconnect said first and second wires electrically, at the same time communication being established between an air conducting part of said first wire and an air conducting part of said second wire through said air conduction path.

2. The connector as defined in claim 1 wherein said terminal of said first wire and said second terminal are of a male-female type connection structure and wherein, when the terminals are electrically connected by insertion to each other, an air conducting part of said first wire and an air conduction part of said second wire are in communication with each other through said closed space formed of at least one spacing selected from the group consisting of a spacing between connecting sections of said terminals, a spacing between said first terminal and said connector, and a spacing between said second terminal and said connector.

3. The connector as defined in claim 1, further comprising first and second connector parts hermetically engaging each other, wherein

the first connector part receives the first terminal hermetically sealed from the exterior, and

the second connector part receives the second terminal hermetically sealed from the exterior.

4. The connector as defined in claim 1, wherein said first and second connector parts are of a male/female engaging structure and said first and second terminals are of a male/female engaging structure.

5. The connector as defined in claim 1, wherein the first and second terminals are directly connected within said connector.

6. The connector as defined in claim 1, wherein the first and second terminals are indirectly connected through an electrical connecting line and said air conduction path formed within said connector.

7. The connector as defined in claim 3, wherein said air connection path is formed across said first and second connector parts within said connector.

8. The connector as defined in claim 1, wherein said at least a sealing is disposed adjacent to the first or second terminal.

9. The connector as defined in claim 1, wherein said air conduction path is made up of at least two sections, the first section extending along an axis of the connector, with the second section intersecting the first section.

10. The connector as defined in claim 9, wherein said second section extending transverse to the connector with one end thereof being open for receiving any one of said terminals of wires, the other end thereof being closed or sealed from the exterior.

11. The connector as defined in claim 1, wherein said terminal has a structure that allows electrical connection between the wire and a counter-partner of the terminal and air connection between the interior of the wire and the air conduction path.

12. The connector as defined in claim 3, wherein said first and second connector parts are of a male and female engaging structure, said second connector part having a bore receiving the second terminal hermetically sealed from the exterior by a sealing, said

bore inside this sealing forming a part of said air conduction path.

13. The connector as defined in claim 12, wherein said bore extends through a protrusion disposed within an opening formed in the first connector part, said opening forming a part of said air conduction path and being hermetically sealed by a sealing interposed between said first and second connector parts.

14. The connection as defined in claim 1, wherein said connector further comprises at least one electrically connecting terminal.

15. A connector system for establishing electric and air connection between at least two wires that allow conduction of electric and air, termed herein as "air conductive wires", the system comprising:

first and second air conductive wires having first and second terminals connected to the first and second air conductive wires, respectively;

a connector assembly for establishing electric and air connection between said air conductive wires;

said connector assembly being configured so as to establish an air conduction path hermetically sealed from the exterior.

16. The connector system as defined in claim 15, wherein said system further comprises;

sealing means for hermetically sealing a spacing between said air conductive wires formed within said connector assembly, so as to receive said terminals within said sealed spacing;

said electric connection between said terminals being direct or indirect;

said air connection being established via said sealed spacing serving as air conduction path within said connector assembly.

17. The connector system as defined in claim 15, wherein said first air conductive wire is adapted for air-conductively connecting to a sensor,

said second air conductive wire is adapted for connecting to an engine control unit under electric and air connection.

18. The connector system as defined in claim 15, wherein said connector assembly is connected under electric and air connection to a control unit for said sensor.

19. The connector system as defined in claim 15, wherein the system further comprises at least one electric wire other than said first and second air conductive wires,

said at least one electric wire and said air conductive wires together making up a harness.

20. A connector and sensor assembly comprising:
said connector system as defined in claim 15, and
a sensor connected to the first air conductive wire,
wherein said connector is further connected with a sensor control unit under electric and air connection.

21. The connector and sensor assembly as defined in claim 20, wherein said sensor is disposed in a first atmosphere, and
said air conduction path is in communication with a second atmosphere different from the first atmosphere.

22. The connector and sensor assembly as defined in claim 20, wherein said first atmosphere is the exterior atmosphere of a motor vehicle, and said second atmosphere is an atmosphere with a higher compatibility to the sensor than the exterior atmosphere.

23. The connector and sensor assembly as defined in claim 22, wherein said second atmosphere is secured from intrusion of water from the first atmosphere.

24. The connector and sensor assembly as defined in claim 20, wherein said sensor comprises a gas sensor for measuring gas components including O₂, NO_x, H₂O, CO₂, CO and HC.

25. The connector and sensor assembly as defined in claim 20, further including a sensor controller which is connected to and

through said connector under electric and air conduction with said sensor.

26. A sensor system having a sensor connectable to an engine controlling unit ECU mounted in an atmosphere communicating with atmospheric air, a sensor controller, and a heater disposed associated with said sensor and supplied with power from the ECU side for heating said sensor, said sensor system comprising

- a connector forming a part of said sensor controller;

- an air conductive sensor side heater wire having one end connected to said heater;

- a sensor side terminal connected to the other end of said sensor side heater wire and inserted into said connector;

- an air conductive ECU side heater wire having one end connected to said ECU;

- an ECU side terminal connected to the opposite end of said ECU side heater wire and inserted into said connector; and

- a sealing unit for hermetically sealing a spacing defined between said sensor side heater wire and said connector and a spacing defined between said ECU side heater wire and said connector, in a state said sensor side terminal and the ECU side terminal have been inserted into said connector, to form a closed space as an air conduction path;

- said sensor side terminal and the ECU side terminal being electrically connected for electrically interconnecting said ECU and the heater, whereby an air conduction part of said sensor side heater wire is in communication through said air conduction path with an air conducting part of said ECU side heater wire to supply atmospheric air from said ECU to said sensor.

27. The sensor system as defined in claim 26 wherein said sensor side terminal and said ECU side terminal are of a male-female type connection structure and wherein, when the terminals are electrically connected by insertion to each other, an air conducting part

of said sensor side heater wire and an air conduction part of said ECU side heater wire are in communication with each other through a spacing between connecting parts of said terminals, and/or a spacing between said sensor side terminal and said connector, and/or a spacing between said ECU side terminal and said connector.

28. The sensor system as defined in claim 26 wherein an electrically conducting section including a first branched section electrically connected to a sensor control board neighboring to said connector, a second branched section electrically connected to said sensor side terminal and a third branched section electrically connected to said ECU side terminal is provided within said connector.